



# Reliability Assessment of District Hospital Systems in Nigeria Using Difference-in-Differences Modelling

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## Abstract

District hospitals in Nigeria face challenges in maintaining reliable service delivery due to resource constraints and operational inefficiencies. A difference-in-differences approach was employed to compare pre- and post-intervention changes in service delivery metrics across selected districts. Data from official health records were analysed using statistical software to estimate the DiD effect. The DiD analysis revealed a significant reduction ( $p < 0.05$ ) of patient wait times by approximately 30% after implementing new operational protocols, indicating improved system reliability. This study underscores the potential of DiD modelling in evaluating healthcare system improvements and highlights the need for ongoing monitoring and support to sustain these gains. District health authorities should prioritise continuous quality improvement initiatives based on findings from this analysis to further enhance patient care and service delivery efficiency. Difference-in-Differences, District Hospitals, Healthcare System Reliability, Nigeria Treatment effect was estimated with  $text\{logit\}(\pi) = \beta_0 + \beta_1 X_i$ , and uncertainty reported using confidence-interval based inference.

**Keywords:** *Sub-Saharan, hospital efficiency, impact evaluation, randomized trials, econometrics, geographic information systems, data analytics*

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